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- c) computing a surround red response, a surround green response and a surround yellow response based on said images;
- d) computing a red, a green and a blue on-center opponent and filtered opponent response, based on said center and surround responses;
- e) computing a red, a green and a yellow off-center opponent and filtered opponent response based on said center and surround responses;
- f) computing a red, a green and a blue double-opponent response (do-response) and a corresponding filtered double-opponent response based on said oncenter and off-center filtered opponent responses;
- g) computing a red, a green and a blue do-remote <u>response</u> [signal] based on a set of responses selected from the group consisting of said on-center filtered opponent responses and said filtered double-opponent responses; and
- h) for each pixel: correcting each of said red, green, and blue double-opponent responses for color contrast using respectively said red, green and blue do-remote response [signals], thereby producing corrected red, green and blue double-opponent responses.
- 2. (Original) The method of claim 1, further comprising the steps of: at each pixel:
 - i) computing a yellow center response and a blue surround response;
- j) computing a yellow double-opponent response and a corresponding yellow filtered double-opponent response based on said yellow center and said blue surround responses;
- k) computing a yellow do-remote signal based on a response selected from the group consisting of said yellow center response and said filtered yellow double-opponent response; and

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- l) for each pixel: correcting said yellow double-opponent response for color contrast using said yellow do-remote signal, thereby producing a corrected yellow double-opponent response.
- The method of claim 1, wherein said step of providing a red (Original) 3. image, a green image, and a blue image includes: at each pixel:
- i) multiplying the intensity spectrum by a spectral response function of a red photoreceptor, thereby providing a red spectral product;
- ii) multiplying the intensity spectrum by a spectral response function of a green photoreceptor, thereby providing a green spectral product; iii) multiplying the intensity spectrum by a spectral response function of a blue photoreceptor, thereby providing a blue spectral product;
 - iv) integrating said red spectral product,
 - v) integrating said green spectral product, and
 - vi) integrating said blue spectral product.
- The method of claim 1, wherein said step of computing a center 4. (Original) red response, a center green response and a center blue response includes, for each said image, convolving said image with a center local spatial filter; and wherein said step of computing a surround red response, a surround green response and a surround yellow response includes, for each said image, convolving said image with a surround local spatial filter.
- The method of claim 2, wherein said step of computing said red 5. (Original) on-center filtered opponent response includes subtracting said green surround response from said red center response, said step of computing said green on-center filtered opponent response includes subtracting said red surround response from said

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green center response, said step of computing said blue on-center response includes subtracting said yellow surround response from said blue center response.

- 6. (Original) The method of claim 2, wherein said step of computing said red off-center filtered opponent response includes subtracting said green surround response from said red center response, said step of computing said green off-center filtered opponent response includes subtracting said red surround response from said green center response, and said step of computing said yellow off-center filtered opponent response includes subtracting said yellow surround response from said blue center response.
- 7. (Original) The method of claim 1, wherein said step of computing said red, green and blue filtered double-opponent responses based on said on-center and off-center filtered opponent responses further includes computing respective red, green and blue double-opponent center responses and respective red, green and blue double-opponent surround response.
- 8. (Original) The method of claim 7, wherein said step of computing each said double-opponent center response includes convolving a center filtered response with a center spatial weight function.
- 9. (Amended) The method of claim 7 [1], wherein said step of computing each said double-opponent surround response includes convolving a surround filtered response with a surround spatial weight function.
- 10. (Original) The method of claim 8, wherein said center spatial weight function is an exponentially decaying function.

- 11. (Original) The method of claim 9, wherein said surround spatial weight function is an exponentially decaying function.
- 12. (Original) The method of claim 7, wherein said step of computing each said do-remote response includes convolving a corresponding response selected from the group consisting of a said on-center filtered opponent response and a said double-opponent center response, with a remote spatial weight function.
- 13. (Original) The method of claim 12, wherein said spatial weight function in chosen from the group consisting of exponentially decaying functions and Gaussian functions.
- 14. (Amended) The method of claim $\underline{2}$ [1], wherein said step of correcting each of said red, green, and blue double-opponent responses for color contrast includes the steps of: for each said double-opponent response
 - a) computing a respective adaptive function G_b ; and
- b) computing a respective adaptation factor, based on said respective adaptive function.
- 15. (Original) The method of claim 14, further including applying said respective adaptation factor as a respective semi-saturation factor in a Naka-Rushton type equation operating on each of said double-opponent responses.
- 16. (Original) The method of claim 2, wherein said step of correcting said yellow double-opponent response for color contrast includes the steps of: for each said double-opponent response:

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- c) computing an adaptive function G_b;
- d) computing an adaptation factor, based on said adaptive function.
- 17. (Original) The method of claim 14, further including applying said adaptation factor as a semi-saturation factor in a Naka-Rushton type equation operating on said yellow double-opponent response.
- 18. (Original) The method of claim 15, wherein said adaptive function is identical to said do-remote response.
- 19. (Original) The method of claim 15, wherein said adaptive function is time-dependent.
- 20. (Original) The method of claim 17, wherein said adaptive function is identical to said do-remote response.
- 21. (Original) The method of claim 17, wherein said adaptive function is time-dependent.
- 22. (Original) The method of claim 19, wherein said time-dependency of said adaptive function is obtained by a convolution of said double-opponent response with a temporal filter.
- 23. (Original) The method of claim 21, wherein said time-dependency of said adaptive function is obtained by a convolution of said double-opponent response with a temporal filter.

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- The method of claim 22, wherein said temporal filter is an 24. (Original) exponentially decaying time function.
- The method of claim 23, wherein said temporal filter is an 25. (Original) exponentially decaying time function.
- The method of claim 22, wherein said temporal filter is (Original) 26. normalized by a denominator equal to $\tau_b(t) = \tau_m/(1 + abs(G(t) - G_b(t))/G_n)$ where τ_m is an expected maximum value of said decaying time function, and where Gn is a normalization constant.
- The method of claim 23, wherein said temporal filter is 27. (Original) normalized by a denominator equal to $\tau_b(t) = \tau_m/(1 + abs(G(t) - G_b(t))/G_n)$ where τ_m is an expected maximum value of said decaying time function, and where Gn is a normalization constant.
- The method of claim 1, further comprising the step of: 28. (Original) inversely transforming said corrected double-opponent responses into corresponding new red, green and blue center responses.
- The method of claim 28, wherein said inversely transforming 29. (Amended) includes transforming said new center [double-opponent cell] responses into new opponent cell responses.

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- The method of claim 2, further comprising the step of: 30. (Original) inversely transforming said corrected yellow double-opponent response to obtain a new yellow opponent response.
- (Cancelled) 31.
- (Cancelled) 32.
- (Amended) A method for adjusting an achromatic contrast of a scene, the 33. scene including an intensity spectrum at each of a plurality of pixels, the method comprising the steps of:
- a) providing an image that has an intensity value at each of the plurality of pixels;
- b) obtaining an adapted opponent center response using a plurality of said pixel intensity values by:
 - i) calculating an opponent center response;
 - ii) providing a center adaptation factor that includes a remote center adaptation term, and
 - iii) combining said opponent center response and said center adaptation factor; and
- c) at each pixel, correcting the achromatic contrast using said adapted opponent center response.
- The method of claim 33, wherein said adaptation factor further 34. (Original) includes a local center adaptation term.

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- The method of claim 33 [32], further comprising obtaining an 35. (Amended) adapted opponent surround response, wherein said step of correcting for achromatic [intensity] contrast includes subtracting said adapted opponent surround response from said adapted opponent center response.
- The method of claim 35, wherein said step of obtaining an 36. (Original) adapted opponent surround response includes:
 - i) calculating an opponent surround response;
 - ii) providing a surround adaptation factor, and
- iii) combining said opponent surround response and said surround adaptation factor.
- The method of claim 36, wherein said surround adaptation 37. (Original) factor includes a remote surround adaptation term.
- The method of claim 36, wherein said surround adaptation 38. (Original) factor further includes a local surround adaptation term.
- The method of claim 33 [31], wherein said step of providing 39. (Amended) pixel intensity values includes: at each pixel: i) multiplying the intensity spectrum by a spectral response function, thereby providing a spectral product; and ii) integrating said spectral product.
- The method of claim 33, wherein said step of obtaining an 40. (Amended). adapted opponent center response includes convolving each said pixel intensity value with a center spatial weight function.

- 41. (Original) The method of claim 36, wherein said step of obtaining an opponent surround response includes convolving each said pixel intensity value with a surround spatial weight function.
- 42. (Original) A method for adjusting an achromatic contrast of a scene, the scene including an intensity spectrum at each of a plurality of pixels, the method comprising the steps of:
- a) providing an image having a pixel value at each of the plurality of pixels;
- b) computing a center response based on said image;
- c) computing a surround response based on said image;
- d) computing an on-center filtered opponent response,

based on said center and surround responses;

- e) computing an off-center filtered opponent response based on said center and surroundresponses;
- f) computing a double-opponent response and a corresponding filtered doubleopponent response based on said on-center and off-center filtered opponent responses;
- g) computing a do-remote response; and
- h) for each pixel: correcting said double-opponent responses for achromatic contrast using said do-remote signal.
- 43. (Original) The method of claim 42, wherein said step of providing an image includes: at each pixel:
- i) multiplying the intensity spectrum by a spectral response function to obtain a spectral product; and
 - ii) integrating said spectral product.

- 44. (Original) The method of claim 42, wherein said step of computing a center response includes convolving said image with a center local spatial filter.
- 45. (Original) The method of claim 42, wherein said step of computing said on-center filtered opponent response includes subtracting an on-center surround response from an on-center center response.
- 46. (Original) The method of claim 42, wherein said step of computing said off-center filtered opponent response includes subtracting an off-center surround response from an off-center center response.
- 47. (Original) The method of claim 42, wherein said step of computing said double-opponent response and said filtered double-opponent response includes computing a double-opponent center response.
- 48. (Original) The method of claim 42, wherein said step of computing said double-opponent response and said filtered double-opponent response further includes computing a double-opponent surround response.